# *Meeting of the ATP Advisory Committee*

## International Panel on Funding R&D Projects

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Board on Science, Technology, and Economic Policy
**The National Academies**

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## Global Practice for a Global Economy?

- Examples of current foreign practice
- U.S. programs (e.g., SEMATECH and ATP) are seen as models

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## International Context: Examples of Foreign Partnerships

- Tekes in Finland
  - similar to ATP - 387M
- Semiconductor Partnerships in Japan
  - ASET Program (1995-2000) - $430 million
  - Six other partnerships underway
- Medea II in Europe
  - JESSI (1988-96) funded at $3.6 billion
  - MEDEA - 500 million Euros annually
- German Seed Capital Program
  - approx. $375 million in 2000
- Belgium's IMEC
  - $90 million annually

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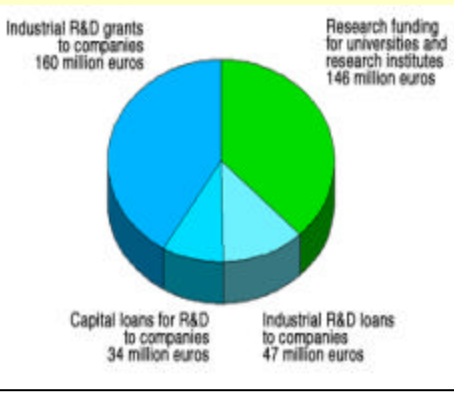
## International Context: R&D in Finland in 2003

**Tekes**

Tekes' funding is targeted at projects which produce new know-how, bear high technological and commercial risks, and in which the of Tekes' funding is substantial substantial impact.

**Tekes R&D funding in 2001**




**Total 387 million euros and 2,261 financed projects.**

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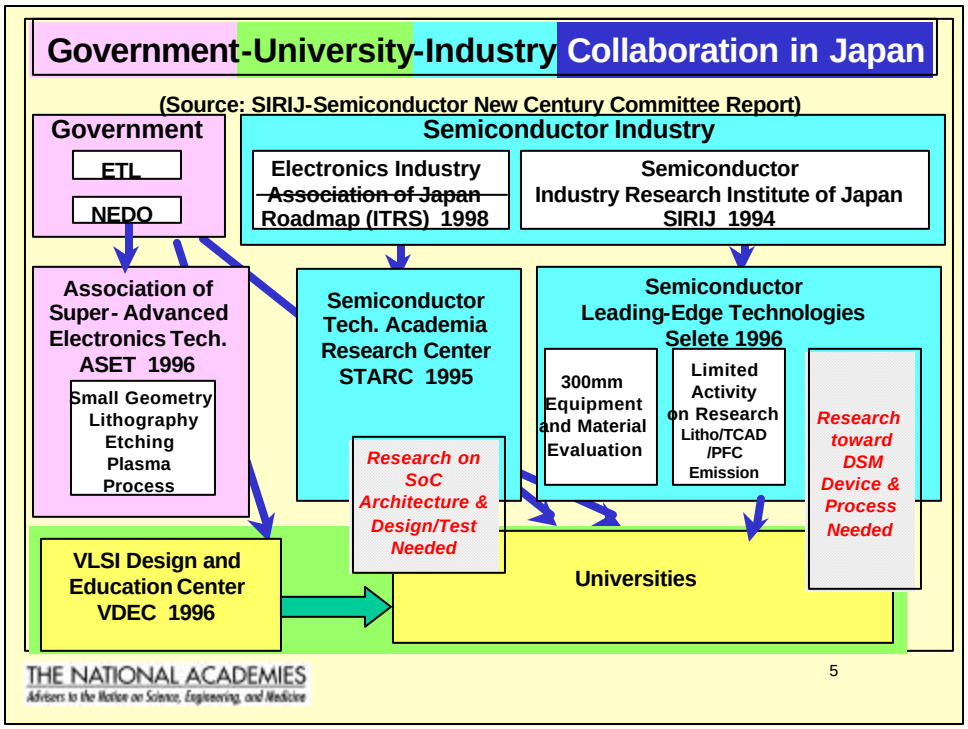





## Major Public Venture Capital Programmes in Germany

- BTU-Scheme
  - Since 1996; forerunner programmes (BJTU; TOU) started 1984
  - Matching funds scheme of tbg (joining a private lead investor)
  - Refinancing of VC fund‘s investment (KfW)
- DtA-Venture Capital Programme
  - Government as lead investor (seed and start-up only)
  - Augmenting BTU co-investment
  - Providing bridge financing for IPO
- KfW`s ERP innovation programme
  - Refinancing possibility for VC fund
- Venture capital schemes at Laender level

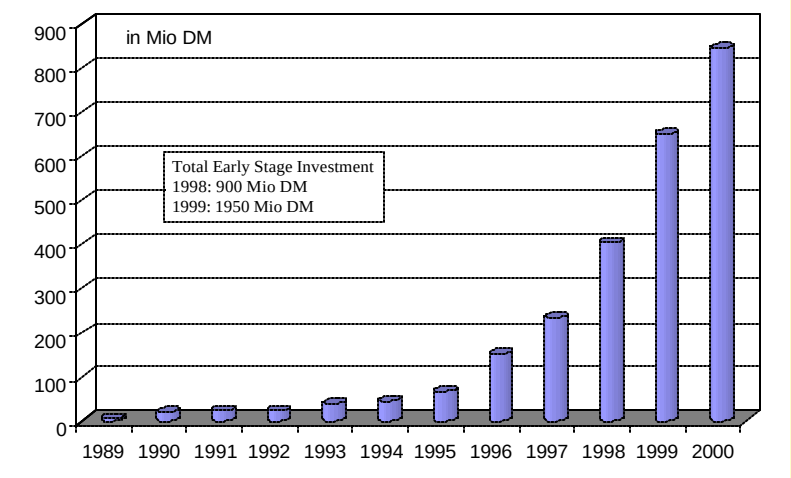
## Features of the BTU programme

| | tbg – matching funds | KfW - refinancing version |
|---|---|---|
| Target Group | New Technology Based Firms<br>Less than 6 years old; Less than 50 employees; Turnover less than Mio 7 Euro | |
| Forms of public investment | Silent partnership<br>Lead investor needed (individual, bank venture capital company) | Refinancing loan below market interest rate for investor covering up to 70% of investment |
| Public risk taking | In case of default government takes up to 50% of the investment of the lead investor (maximum 50% of government's own investment) | Government gives a 100% loan guarantee for the refinancing loan |
| Conditions | 7% rate of return on investment without regard of profitability of BTU (+ since 1999 small share of profits) | Fixed interest rate (below market interest) |
| Max. Size | 1.5 Mio Euro of co-investment | 1.4 Mio Euro for refinancing loan |





## Public Funds Commited within the BTU/BJTU Schemes




2000 estimated based on tbg data

## National Programs to Support the Semiconductor Industry

*Many nations are actively and substantially supporting initiatives in their respective national semiconductor industries.*

- ***Japan***
  - Next Generation Semiconductor R&D Center (Super clean room)
    - 2001-08
    - $300 million ($60 million in 2001)*
    - Process and device technology for 70 mm generation

* METI requested $60 million in FY2001 budget for first year of a 7-year project



## National Programs to Support the Semiconductor Industry, *continued*

- ***Japan***
  - Future Information Society Creation Laboratory
    - 2001-06
    - $300 million
    - Create small-scale, very short-term semiconductor production line
- ***Japan***
  - ASET
    - 1995-
    - $500 million
    - Lithography, semiconductor manufacturing technology

## National Programs to Support the Semiconductor Industry, *continued*

- ***Japan***
  - Nanotechnology Programs
    - 1985-
    - $350 million in FY 2001; METI labs conducting R&D
    - Basic R&D nanotechnology, includes microelectronics themes
- ***Japan***
  - Selete*
    - 1996-
    - Privately funded but received NEDO contract to develop technology to cut PFC use.
    - Manufacturing technology for 300-mm wafers

*Samsung is also a member of Selete.



## National Programs to Support the Semiconductor Industry, *continued*

- ***Taiwan***
  - ASTRO
    - 2000-
    - Government will fund half
    - Technology induction, upgrading of local industry
- ***European Union***
  - MEDEA
    - 1997-2000
    - $720 million (est.)
    - Process technology, design, applications

## National Programs to Support the Semiconductor Industry, *continued*

- ***European Union***
  - MEDEA Plus
    - 2001-09
    - $1,350 million (est.)
    - Systems-on-a-chip, UV lithography
- ***Germany***
  - Semiconductor 300
    - 1996-2000
    - $680 million
    - 300 mm wafer technology



## National Programs to Support the Semiconductor Industry, *continued*

- ***France***
  - Crolles I and II
    - 1998-
    - $136 million (est.)*
    - Pilot 300 mm fab
- ***United States***
  - MARCO
    - 1997-
    - $75 million over 6 years
    - Basic microelectronics R&D

**Crolles I* reportedly received support of FF 900 million to FF 1 billion. Additional funds have been requested for *Crolles II*.

## National Programs to Support the Semiconductor Industry, *continued*

- ***United States***
  - DARPA
    - Permanent
    - $192 million in 2000 for "advanced electronics" technology"
    - Advanced lithography; nanomechnisms; electronic modules
- ***United States***
  - National Nanotechnology Initiative
    - 2000-
    - $270 million in 2000
    - Basic R&D on nanotechnology; includes same microelectronics themes



## National Programs to Support the Semiconductor Industry, *continued*

- ***United States***
  - SEMATECH
    - 1989-1996
    - $850 million
    - Cooperative research facility to benchmark next -generation development of processes, products and tools; forum for information exchange and coordination of research projects.
- ***United States***
  - EUVL (Extreme Ultraviolet Lithography) CRADA*
    - 1997-
    - $250 million
    - Advanced lithography

*The EUVL CRADA is in fact an international effort.